Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
	% Removal	85	--	--	--	--

1 No WQBEL's are applicable, therefore, TBELs are implemented in this Order.
2 More stringent WQBEL required.
3 Based on design flow of 1.5 MGD.

C. Water Quality-Based Effluent Limitations (WQBEL's)

1. Scope and Authority

CWA Section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) of 40 C.F.R. requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBEL's must be established using: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBEL's when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan.

The Basin Plan on page II-1.00 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…*" and with respect to disposal of wastewaters states that "*...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*"

The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.*" Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the

water, agricultural, industrial and other purposes including navigation. 40 C.F.R. section 131.3(e) defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 C.F.R. section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

a. **Receiving Water and Beneficial Uses.** Refer to III.C.1. above for a complete description of the receiving water and beneficial uses.

b. **Effluent and Ambient Background Data.** The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data from 1 December 2014 through 31 January 2018, which includes effluent and ambient background data submitted in SMRs, the Report of Waste Discharge (ROWD), the Effluent and Receiving Water Characterizations Study, and the North Fork Calaveras River Dilution/Mixing Zone Study.

c. **Water Effects Ratio Study For Copper.** This Order allows for a site-specific water effects ratio (WER) of 7.55 to calculate the aquatic life criteria for copper based on the Discharger's *Copper Water Effects Ratio Study* (August 2013). The Discharger's study followed U.S. EPA's 2001 *Streamlined Water-Effect Ratio Procedure for Discharges of Copper* (EPA 822-R-01-005). This Order calculates the aquatic life criteria for copper using a total recoverable WER of 7.55. A discussion on the calculation of the criteria for hardness dependent metals, such as copper, can be found in Section IV.C.2.f. below.

d. **Assimilative Capacity/Mixing Zone.**

   i. **Receiving Water Characteristics**. The Facility discharges to the North Fork Calaveras River when 20:1 (receiving water to effluent) conditions exist. The outfall diffuser consists of two parallel 12" perforated pipes located in a cross-stream concrete box filled with 3" cobble bedding. The diffuser pipes are located approximately one foot below the upper surface of the cobble filled concrete box. The length of the perforated section of the cross-stream diffuser pipes is estimated to be approximately 36 feet. The concrete outfall box is approximately 41 feet long and approximately 6 feet wide. Immediately downstream of the outfall diffuser box is a cross-stream concrete ford. When constructed, the concrete ford was approximately 18 feet wide. Since construction, the downstream edge of the concrete ford has eroded and is now narrower than 18 feet in most locations.

   ii. **Regulatory Guidance for Dilution Credits and Mixing Zones.** The Central Valley Water Board has the discretion to accept or deny mixing zones and dilution credits. The CWA directs the states to adopt water quality standards to protect the quality of its waters. USEPA's current water quality standards regulation authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 CFR § 122.44 and 122.45). The USEPA allows states to have broad flexibility in designing its mixing zone policies. Primary policy and guidance on determining mixing zone and dilution credits is provided by the SIP and the Basin Plan. If no procedure applies in the SIP or the Basin Plan, then the Central Valley Water Board may use the USEPA *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001)(TSD).

For non-Priority Pollutant constituents the allowance of mixing zones by the Central Valley Water Board is discussed in the Basin Plan, *Policy for Application of Water Quality Objectives*, which states in part, "*In conjunction with the issuance of NPDES and storm water permits, the Regional Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Board will consider the applicable procedures and guidelines in the EPA's Water Quality Standards Handbook and the [TSD]. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.*"

For Priority Pollutants, the SIP supersedes the Basin Plan mixing zone provisions. Section 1.4.2 of the SIP states, in part, "*…with the exception of effluent limitations derived from TMDL's, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers…The applicable priority pollutant criteria and objectives are to be met through a water body except within any mixing zone granted by the Regional Board.* ***The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis.*** *The Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board.*" [emphasis added]

For incompletely-mixed discharges, the Discharger must complete an independent mixing zone study to demonstrate to the Central Valley Water Board that a dilution credit is appropriate. In granting a mixing zone, Section 1.4.2.2 of the SIP requires the following to be met:

"***A mixing zone shall be as small as practicable****. The following conditions must be met in allowing a mixing zone:* [emphasis added]

A: A mixing zone shall not:

1. *compromise the integrity of the entire water body;*
2. *cause acutely toxic conditions to aquatic life passing through the mixing zone;*
3. *restrict the passage of aquatic life;*
4. *adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;*
5. *produce undesirable or nuisance aquatic life;*
6. *result in floating debris, oil, or scum;*

TENTATIVE DRAFT

7. *produce objectionable color, odor, taste, or turbidity;*
8. *cause objectionable bottom deposits;*
9. *cause nuisance;*
10. *dominate the receiving water body or overlap a mixing zone from different outfalls; or*
11. *be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy.*"

Section 1.4.2.1 of the SIP establishes the authority for the Central Valley Water Board to consider dilution credits based on the mixing zone conditions in a receiving water. Section 1.4.2.1 in part states:

"*The dilution credit, D, is a numerical value associated with the mixing zone that accounts for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations (described in Section 1.4).* **Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some, or no priority pollutants in the discharge.**" [emphasis added]

The mixing zone is thus an administrative construct defined as an area around the outfall that may exceed water quality objectives, but is otherwise protective of the beneficial uses. Dilution is defined as the amount of mixing that has occurred at the edge of this mixing zone under critical conditions, thus protecting the beneficial uses at the concentration and for the duration and frequency required.

iii. **Dilution/Mixing Zone Study Results.** The Discharger provided the North Fork Calaveras River Dilution/Mixing Zone Study on 24 January 2018 providing the results of a field dilution/mixing zone study using effluent EC as a tracer.

During the implementation of the field study, the river flow rate, measured downstream of effluent discharge, was 7.9 MGD, which is within the typical range of river flow conditions under which effluent discharge occurs. The Discharger's effluent discharge flow rate to the North Fork Calaveras River is controlled by the Discharger's operations staff. For this study, the Discharger set the effluent flow rate to target a 20:1 river dilution ratio. During the time of field study implementation, the average effluent discharge rate, as recorded by the Discharger's automated data recording system, was 0.39 MGD.

The field study was conducted during the discharge of Facility effluent into the North Fork Calaveras River at a dilution ratio of 20:1 (receiving water flow: effluent flow), as measured downstream of the outfall. Effluent EC was measured from the District's effluent sampling port within the Facility's effluent control building, upstream of the outfall to the North Fork Calaveras River. The background river EC was measured mid-stream, mid-depth, upstream of the effluent outfall. The in-stream EC, resulting from discharge of effluent at a 20:1 dilution ratio, was measured on the concrete ford downstream of the effluent outfall, at various transects, using a calibrated hand-held YSI field EC meter. In-stream EC readings, obtained downstream of the effluent outfall, are used to

approximate the percentage of effluent in the river (i.e., the dilution ratio and extent of dispersion) at cross-sectional locations at each monitored transect. River EC measurements, downstream of the outfall, obtained during this field study were limited to the area of the concrete ford the expected mixing zone based the Discharger's previous work, and a location with limited aquatic habitat.

To obtain the data necessary to determine the mixing and dilution ratios of effluent with river water, mid-depth EC measurements were taken on a pre-determined grid (3' intervals) on the concrete ford immediately downstream of the effluent outfall structure. Using the EC data collected, a dilution ratio is determined at each monitored location using the following formula:

$$\text{Dilution (parts river to 1 part effluent)} = \frac{(\text{Effluent EC} - \text{Downstream EC})}{(\text{Downstream EC} - \text{Background EC})}$$

The EC/dilution ratio data are used to identify 1) an aquatic life zone of passage and 2) the edges of the maximum aquatic life mixing zone.

The effluent outfall diffuser is located approximately one mile northwest of the WWTP in the North Fork Calaveras River. The effluent outfall is located immediately upstream of the historic concrete ford that crosses the river. The river is a shallow gradient stream at this location. The river study area was limited to the portion of the concrete ford covered by flowing water. The river depth on the concrete ford varied between 1.25 and 6 inches. Data points were collected at seven cross-stream transects downstream from the outfall (spaced at 3 feet on-center). At each monitoring transect, data were collected at three-foot intervals.

Based on the results of the field study, conducted under typical effluent discharge flow conditions, a minimum dilution ratio of 6.4:1 was observed at the monitoring transect immediately downstream of the outfall diffuser box. Thus, the 6:1 dilution ratio mixing zone boundary is located below the surface of the cobble-filled outfall diffuser box. The edge of the 12:1 dilution ratio mixing zone is at the downstream edge of the concrete ford (16-18 feet downstream from the effluent diffuser box).

iv. **Evaluation of Available Dilution for Acute and Chronic Aquatic Life Criteria**. U.S. EPA Region VIII, in its "*EPA Region VIII Mixing Zones and Dilution Policy*", recommends no dilution for acute aquatic life criteria, stating the following, "*In incomplete mix situations, discharge limitations to implement acute chemical-specific aquatic life criteria and narrative (no acute toxicity) criteria shall be based on achieving such acute criteria at the end-of-pipe (i.e., without an allowance for dilution). This approach is intended to implement the narrative requirement prohibiting acutely toxic conditions in the mixing zone.*" The Discharger has requested acute and chronic mixing zones for compliance with acute and chronic water quality criteria. Based on the mixing zone study, the requested acute and chronic aquatic life mixing zone the width of the outfall diffuser and extends 16-18 feet downstream of the effluent diffuser.

The acute and chronic mixing zones meet the requirements of the SIP as follows:

(a) *Shall not compromise the integrity of the entire waterbody – The TSD states that, "If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a waterbody (such as a river segment), then mixing zones are likely to have little effect on the integrity of the waterbody as a whole, provided that the mixing zone does not impinge on unique or critical habitats."* This criterion is met by establishing effluent limitations via the SIP procedure such that no water quality criteria are violated because of the effluent discharge outside of the small portion of the receiving water defined by the mixing zone. The mixing zone located on the concrete ford is a small fraction of the overall length of the North Fork Calaveras River, therefore, the mixing zone does not compromise the integrity of the entire waterbody.

(b) *Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone* – This criterion is met via the effluent limitation, contained in the Order, that survival of aquatic organisms in 96-hour whole effluent (no dilution) bioassays shall be no less than:

- 70 percent, minimum for any one bioassay; and
- 90 percent, median for any three consecutive bioassays.

The effluent, without dilution (i.e., 100% effluent), is not permitted to be acutely toxic to aquatic life. Therefore, the effluent without dilution cannot cause acute toxic conditions in the North Fork Calaveras River. The effluent discharge will be undiluted only at the actual effluent discharge point. The effluent discharge point was selected to maximize the rate of dilution of one part effluent into at least 20 parts stream flow. Only a small area of the stream (immediately downstream of the outfall) will have elevated effluent concentrations and by definition, the stream flow on either side of the effluent discharge point will have little to no effluent. The areas of the stream with little to no effluent provide zones of passage around the actual effluent discharge point for any aquatic life that is disposed to avoid higher concentrations of effluent for any reason. As part of the study, the concentration gradients around the discharge point were measured (using EC as the tracer) to quantify the zone of higher effluent concentration and the zones of passage around the effluent discharge point. The observed acute mixing zone is shorter in length than the distance aquatic life would be expected to migrate up or down in this stream over a four-day (96-hour) period. Therefore, the four-day whole effluent acute toxicity bioassay is believed to be a conservative monitor of whether compliance with this mixing zone criterion is being achieved.

(c) *Shall not restrict the passage of aquatic life* – This criterion is met by complying with the acute lethality requirement discussed previously, and by the fact that the mid-stream effluent discharge point design provides zones of passage around the effluent discharge point containing little to no effluent. The mixing zone field study measured the EC gradients from the maximum effluent discharge under typical stream flow conditions around and downstream of the effluent discharge point. As discussed previously, the study was conducted under a dilution ratio of 20 parts receiving water for every one part effluent (i.e., 20:1).

Additionally, the effluent outfall structure in no way physically obstructs the passage of any form of aquatic life past the effluent discharge point. Note

that the cross-stream diffuser is located just upstream of an 18-foot wide concrete ford which does not support aquatic life under low flow conditions. Further, under low flow conditions, the concrete ford restricts the passage of aquatic life. Also note that a dam is located approximately 1,000 feet downstream of the outfall diffuser, which restricts upstream migration of aquatic life to those that migrate when river flows occur, and are capable of either jumping the fall created by the dam, or navigating around it.

(d) *Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws* – A search of the California Department of Fish and Wildlife California Natural Diversity Database (CNDDB) and the United States Forest Service Critical Habitat Database found that the North Fork Calaveras River is not critical habitat and does not contain endangered species. Thus, if the SIP procedures for setting effluent limitations are followed, and if the effluent complies with those effluent limitations, then this criterion will be met.

(e) *Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; cause nuisance* – The current discharge has not been shown to result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance. This Order requires end-of-pipe limitations for individual constituents and discharge prohibitions to prevent these conditions from occurring, which will ensure continued compliance with these mixing zone requirements. With these requirements the acute and chronic mixing zones will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.

(f) *Shall not dominate the receiving water body or overlap a mixing zone from different outfalls* – By complying with SIP-derived effluent limitations, the 20:1 minimum dilution ratio (parts receiving water : part effluent), and receiving water limitations contained in this Order, the Discharger's effluent discharge cannot dominate the North Fork Calaveras River as a matter of fact. Additionally, the maximum mixing zone is a small part of the North Fork Calaveras River water body. There are no other existing or planned outfalls discharging to the North Fork Calaveras River in the vicinity of the outfall. Thus, the mixing zone identified in this study will not overlap a mixing zone from any different outfall.

(g) *Shall not be allowed at or near any drinking water intake* – Compliance with this criterion is satisfied because there are no drinking water intakes on the North Fork Calaveras River at or near the District's effluent discharge point. Additionally, the North Fork Calaveras River does not contain the Basin Plan beneficial use designation MUN.

The acute and chronic aquatic life mixing zone therefore complies with the SIP. The mixing zone also complies with the Basin Plan, which requires that the mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Central Valley Water Board considered the

procedures and guidelines in the EPA's *Water Quality Standards Handbook, 2nd Edition* (updated July 2007), Section 5.1, and Section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

v. **Evaluation of Available Dilution for Specific Constituents (Pollutant-by-Pollutant Evaluation).** When determining to allow dilution credits for a specific pollutant, several factors must be considered, such as available assimilative capacity, facility performance, and best practicable treatment or control (BPTC). A pollutant-by-pollutant evaluation of dilution is discussed below:

(a) **Ammonia.** The receiving water contains assimilative capacity for ammonia and acute and chronic aquatic life mixing zones for this constituent meet the mixing zone requirements of the SIP. Section 1.4.2.2 of the SIP requires that, "*A mixing zone shall be as small as practicable.*", and Section 1.4.2.2.B requires, "*The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.*" Based on a 20:1 (receiving water to effluent) flow requirement for discharge to the North Fork Calaveras River, the maximum dilution credit that could be allocated to the Discharger for ammonia is 12. However, as discussed in the North Fork Calaveras River Dilution/Mixing Zone Study, a dilution credit of only 6 is necessary to achieve compliance with WQBEL's for ammonia. This represents a mixing zone that is as small as practicable for ammonia and that fully complies with the SIP.

(b) **Cyanide.** The receiving water contains assimilative capacity for cyanide and acute and chronic aquatic life mixing zones for this constituent meet the mixing zone requirements of the SIP. Section 1.4.2.2 of the SIP requires that, "*A mixing zone shall be as small as practicable.*", and Section 1.4.2.2.B requires, "*The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.*" Based on a 20:1 (receiving water to effluent) flow requirement for discharge to the North Fork Calaveras River, the maximum dilution credit that could be allocated to the Discharger for cyanide is 12. However, as discussed in the North Fork Calaveras River Dilution/Mixing Zone Study, a dilution credit of only 6 is necessary to achieve compliance with WQBEL's for cyanide. This represents a mixing zone that is as small as practicable for cyanide and that fully complies with the SIP.

(c) **Chronic Toxicity Numeric Trigger.** The current numeric chronic toxicity trigger in Order R5-2014-0104-01 is >4 TUc, which the Discharger was not able to consistently comply with for *Ceriodaphnia dubia* reproduction. Section 1.4.2.2 of the SIP requires that, "*A mixing zone shall be as small as practicable.*", and Section 1.4.2.2.B requires, "*The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.*" Based on a 20:1 (receiving water to effluent) flow requirement for discharge to the North Fork Calaveras River, the maximum dilution credit that could be allocated to the Discharger for the numeric chronic toxicity trigger is 12, which is associated with a mixing zone 16-18 feet in length. This represents a mixing zone that is as small as practicable for the Facility and that fully complies with the SIP.

vi. **Regulatory Compliance for Dilution Credits and Mixing Zones**. To fully comply with all applicable laws, regulations and policies of the State, Central Valley Water Board approved a mixing zone and the associated dilution credits shown in Table F-6 based on the following:

(a) Mixing zones are allowed under the SIP provided all elements contained in Section 1.4.2.2 are met. Based on the mixing zone study conducted by the Discharger the Central Valley Water Board has determined that these factors are met.

(b) Section 1.4.2.2.of the SIP requires mixing zones to be as small as practicable. Based on the mixing zone study conducted by the Discharger the Central Valley Water Board has determined the mixing zone is as small as practicable.

(c) In accordance with Section 1.4.2.2 of the SIP, the Board has determined the mixing zone is as small as practicable, will not compromise the integrity of the entire water body, restrict the passage of aquatic life, dominate the water body or overlap existing mixing zones from different outfalls. The mixing zone is small (approximately 3 feet downstream of the discharge for ammonia and cyanide and 16-18 feet downstream of the discharge for toxicity) relative to the large size of the receiving water (approximately 1.5 miles), is not at or near a drinking water intake, and does not overlap a mixing zone from a different outfall.

(d) The Central Valley Water Board has determined allowing mixing zones for aquatic life criteria will not cause acutely toxic conditions to aquatic life passing through the mixing zone.

(e) The Central Valley Water Board has determined the discharge will not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under the federal or State endangered species laws, because the mixing zone is relatively small, and acutely toxic conditions will not occur in the mixing zone. The discharge will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum, produce objectionable odor, taste, or turbidity, cause objectionable bottom deposits, or cause nuisance, because the proposed Order establishes end-of-pipe effluent limitations (e.g., for BOD_5 and TSS) and discharge prohibitions to prevent these conditions from occurring.

(f) As required by the SIP, in determining the extent of or whether to allow a mixing zone and dilution credit, the Central Valley Water Board has considered the presence of pollutants in the discharge that are carcinogenic, mutagenic, teratogenic, persistent, bioaccumulative, or attractive to aquatic organisms, and concluded that the allowance of the mixing zone and dilution credit is adequately protective of the beneficial uses of the receiving water.

(g) The Central Valley Water Board has determined mixing zone complies with the SIP for priority pollutants.

(h) The mixing zone study indicates the maximum allowed dilution factor to be 12:1 for aquatic life constituents. Section 1.4.2.2B of the SIP, in part states, *"The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements."* The Central Valley Water Board has determined for cyanide a dilution factor of 12:1 is not

needed or necessary for the Discharger to achieve compliance with this Order. As discussed above, the dilution credit has been reduced to 6:1 for cyanide.

(i) The Central Valley Water Board has determined the mixing zone complies with the Basin Plan for non-priority pollutants. The Basin Plan requires a mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Central Valley Water Board has considered the procedures and guidelines in Section 5.1 of USEPA's *Water Quality Standards Handbook*, 2nd Edition (updated July 2007) and Section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

(j) The Central Valley Water Board has determined that allowing dilution factors that exceed those proposed by this Order would not comply with the State Anti-degradation Policy for receiving waters outside the allowable mixing zone for cyanide. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 (State Anti-Degradation Policy). The State Anti-Degradation Policy incorporates the federal antidegradation policy and requires that existing quality of waters be maintained unless degradation is justified based on specific findings. Item 2 of the State Anti-Degradation Policy states:

> *"Any activity which produces or may produce a waste or increased volume or concentration of waste and which dischargers or proposed to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."*

(k) The effluent limitations established in the Order for ammonia and cyanide that have been adjusted for dilution credits provided in Table F-6 were developed based on performance of the Discharger's current wastewater treatment capabilities. Therefore, the Central Valley Water Board determined the effluent limitations required by this Order will result in the Discharger implementing best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Central Valley Water Board also determined the Discharger will be in immediate compliance with the effluent limitations,

(l) The Central Valley Water Board also determined establishing effluent limitations for ammonia and cyanide that have been adjusted for dilution credits provided in Table F-6 is consistent with Section 1.4.2.2B of the SIP that requires the Central Valley Water Board to shall deny or significantly limit a mixing zone and dilution credits as necessary to comply with other regulatory requirements.

Therefore, the Central Valley Water Board has determined the effluent limitations established in the Order for ammonia and cyanide that have been adjusted for dilution credits provided in Table F-6 are appropriate and

necessary to comply with the Basin Plan, SIP, Federal anti-degradation regulations and the State Anti-Degradation Policy.

Table F-6. Minimum North Fork Calaveras River Dilution Ratios

Distance Downstream of Outfall (ft)	Minimum Dilution Ratio (Parts river to 1 part effluent)
3[1]	6.4
16-18[2]	12

1. Mixing zone length for ammonia and cyanide.
2. Mixing zone length for chronic toxicity numeric trigger.

e. **Conversion Factors.** The CTR contains aquatic life criteria for arsenic, cadmium, chromium III, chromium VI, copper, lead, nickel, silver, and zinc which are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The default USEPA conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria.

f. **Hardness-Dependent CTR Metals Criteria.** The CTR and the NTR contain water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

This Order has established the criteria for hardness-dependent metals based on the hardness of the receiving water (actual ambient hardness) as required by the SIP[1] and the CTR[2]. The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for these metals. The CTR requires that the hardness values used shall be consistent with the design discharge conditions for design flows and mixing zones[3]. Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10).[4] This section of the CTR also indicates that the design conditions should be established such that the appropriate criteria are not exceeded more than once in a

[1] [1] The SIP does not address how to determine the hardness for application to the equations for the protection of aquatic life when using hardness-dependent metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water.

[2] [2] The CTR requires that, for waters with a hardness of 400 mg/L (as $CaCO_3$), or less, the actual ambient hardness of the surface water must be used (40 C.F.R. § 131.38(c)(4)).

[3] [3] 40 C.F.R. §131.3(c)(4)(ii)

[4] [4] 40 C.F.R. §131.38(c)(2)(iii) Table 4

three year period on average.[5] The CTR requires that when mixing zones are allowed the CTR criteria apply at the edge of the mixing zone, otherwise the criteria apply throughout the water body including at the point of discharge. [6] The CTR does not define the term "ambient," as applied in the regulations. Therefore, the Central Valley Water Board has considerable discretion to consider upstream and downstream ambient conditions when establishing the appropriate water quality criteria that fully complies with the CTR and SIP.

Summary findings

The ambient hardness for the North Fork Calaveras River is represented by the data in Figure F-1, below, which shows ambient hardness ranging from 46 mg/L to 152 mg/L based on collected ambient data from December 2014 through Januray 2018. Given the high variability in ambient hardness values, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum). Because of this variability, staff has determined that based on the ambient hardness concentrations measured in the receiving water, the Central Valley Water Board has discretion to select ambient hardness values within the range of 46 mg/L (minimum) up to 152 mg/L (maximum). Staff recommends that the Board use the ambient hardness values shown in Table F-7 for the following reasons.

i. Using the ambient receiving water hardness values shown in Table F-7 will result in criteria and effluent limitations that ensure protection of beneficial uses under all ambient receiving water conditions.

ii. The Water Code mandates that the Central Valley Water Board establish permit terms that will ensure the reasonable protection of beneficial uses. In this case, using the lowest measured ambient hardness to calculate effluent limitations is not required to protect beneficial uses. Calculating effluent limitations based on the lowest measured ambient hardness is not required by the CTR or SIP, and is not reasonable as it would result in overly conservative limits that will impart substantial costs to the Discharger and ratepayers without providing any additional protection of beneficial uses. In compliance with applicable state and federal regulatory requirements, after considering the entire range of ambient hardness values, Board staff has used the ambient hardness values shown in Table F-6 to calculate the proposed effluent limitations for hardness-dependent metals. The proposed effluent limitations are protective of beneficial uses under all flow conditions.

iii. Using an ambient hardness that is higher than the minimum of 34 mg/L will result in limits that may allow increased metals to be discharged to the river, but such discharge is allowed under the State Antidegradation Policy (State Water Board Resolution 68-16). The Central Valley Water Board finds that this degradation is consistent with the antidegradation policy (see antidegradation findings in Section IV.D.4 of the Fact Sheet). The Antidegradation policy requires the Discharger to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to

[5] [5] 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

[6] [6] 40 C.F.R. §131.38(c)(2)(i)

assure that: a) a pollution or nuisance will not occur, and b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

iv. Using the ambient hardness values shown in Table F-6 is consistent with the CTR and SIP's requirements for developing metals criteria.

Table F-7. Summary of CTR Criteria for Hardness-dependent Metals

CTR Metals	Ambient Hardness (mg/L)[2,3]	CTR Criteria (µg/L, total recoverable)[1]	
		acute	chronic
Copper	50	7.3	5.2
Chromium III	50	984	117
Cadmium	50 (acute) 50(chronic)	2.1	1.4
Lead	50	34	1.3
Nickel	50	261	29
Silver	50	1.2	--
Zinc	50	67	67

[1] Metal criteria rounded to two significant figures in accordance with the CTR (40 C.F.R. §131.38(b)(2)).

[2] The ambient hardness values in this table represent actual observed receiving water hardness measurements from the dataset shown in Figure F-1.

[3] The CTR's hardness dependent metals criteria equations vary differently depending on the metal, which results in differences in the range of ambient hardness values that may be used to develop effluent limitations that are protective of beneficial uses and comply with CTR criteria for all ambient flow conditions.

Background

The State Water Board provided direction regarding the selection of hardness in two precedential water quality orders; WQO 2008-0008 for the City of Davis Wastewater Treatment Plant (Davis Order) and WQO 2004-0013 for the Yuba City Wastewater Treatment Plant (Yuba City Order). The State Water Board recognized that the SIP and the CTR do not discuss the manner in which hardness is to be ascertained, thus regional water boards have considerable discretion in determining ambient hardness so long as the selected value is protective of water quality criteria under the given flow conditions. (Davis Order, p.10). The State Water Board explained that it is necessary that, "The [hardness] value selected should provide protection for all times of discharge under varying hardness conditions." (Yuba City Order, p. 8). The Davis Order also provides that, "Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions." (Davis Order, p. 11)

The equation describing the total recoverable regulatory criterion, as established in the CTR, is as follows:

CTR Criterion = WER x ($e^{m[\ln(H)]+b}$) (Equation 1)

Where:

H = ambient hardness (as $CaCO_3$) [7]

WER = water-effect ratio

m, b = metal- and criterion-specific constants

The direction in the CTR regarding hardness selection is that it must be based on ambient hardness and consistent with design discharge conditions for design flows and mixing zones. Consistent with design discharge conditions and design flows means that the selected "design" hardness must result in effluent limitations under design discharge conditions that do not result in more than one exceedance of the applicable criteria in a three year period.[8] Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10). The 1Q10 and 7Q10 North Fork Calaveras River flows are 4.8 cfs and 5.4 cfs, respectively.

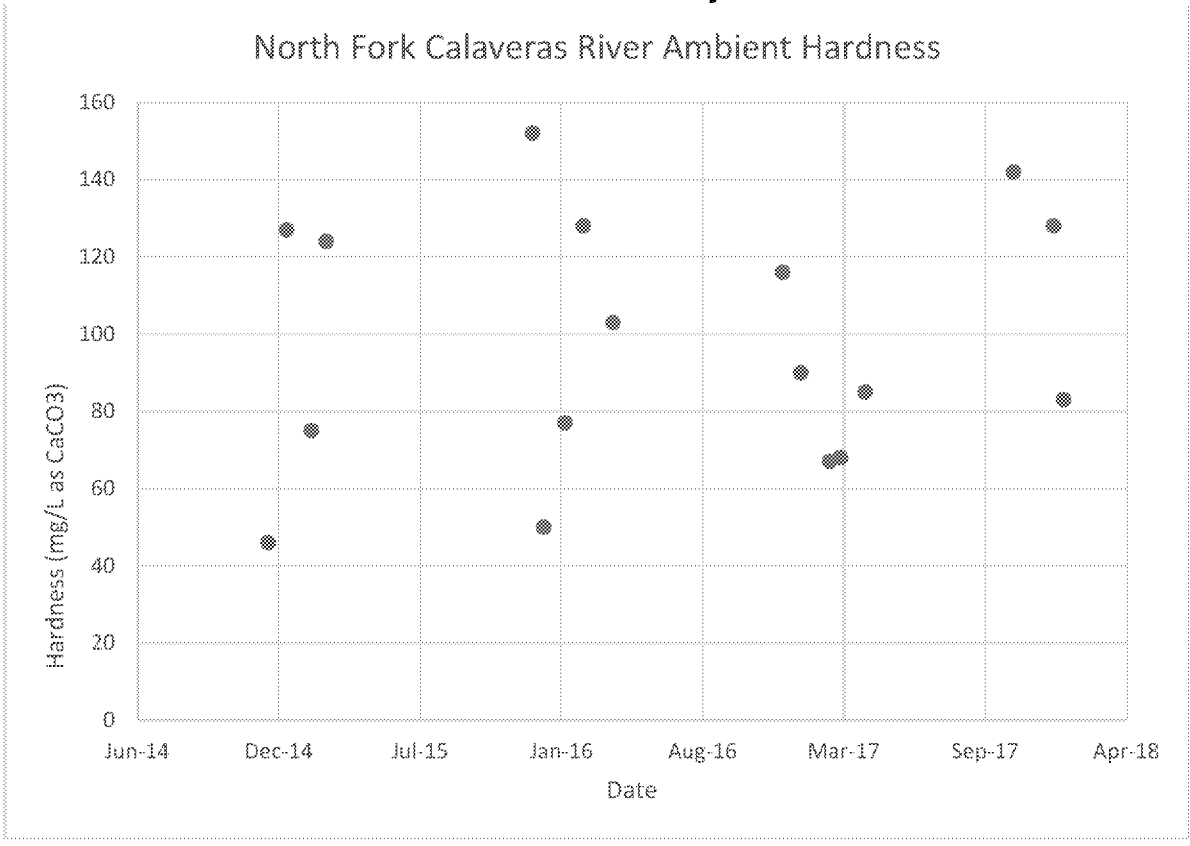
Ambient conditions

The ambient receiving water hardness varied from 46 mg/L to 152 mg/L, based on 17 samples from December 2014 through January 2018 (see Figure F-1).

[7] [7] For this discussion, all hardness values are expressed in mg/L as $CaCO_3$.

[8] [8] 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

**Figure F-1. Observed Ambient Hardness Concentrations
December 2014 – January 2018**



In this analysis, the entire range of ambient hardness concentrations shown in Figure F-X were considered to determine the appropriate ambient hardness to calculate the CTR criteria and effluent limitations that are protective under all discharge conditions.

Approach to derivation of criteria

As shown above, ambient hardness varies substantially. Because of the variation, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum, mid-point). While the hardness selected must be hardness of the ambient receiving water, selection of an ambient receiving water hardness that is too high would result in effluent limitations that do not protect beneficial uses. Also, the use of minimum ambient hardness would result in criteria that are protective of beneficial uses, but such criteria may not be representative considering the wide range of ambient conditions.

Reasonable worst-case ambient conditions. To determine whether a selected ambient hardness value results in effluent limitations that are fully protective while complying with federal regulations and state policy, staff have conducted an analysis considering varying ambient hardness and flow conditions. To do this, the Central Valley Water Board has ensured that the receiving water hardness and criteria selected for effluent limitations are protective under "reasonable-worst case ambient conditions." These conditions represent the receiving water conditions under which derived effluent limitations would ensure protection of beneficial uses under all ambient flow and hardness conditions.

Reasonable worst-case ambient conditions:

- "Low receiving water flow." CTR design discharge conditions (1Q10 and 7Q10) have been selected to represent reasonable worst case receiving water flow conditions.

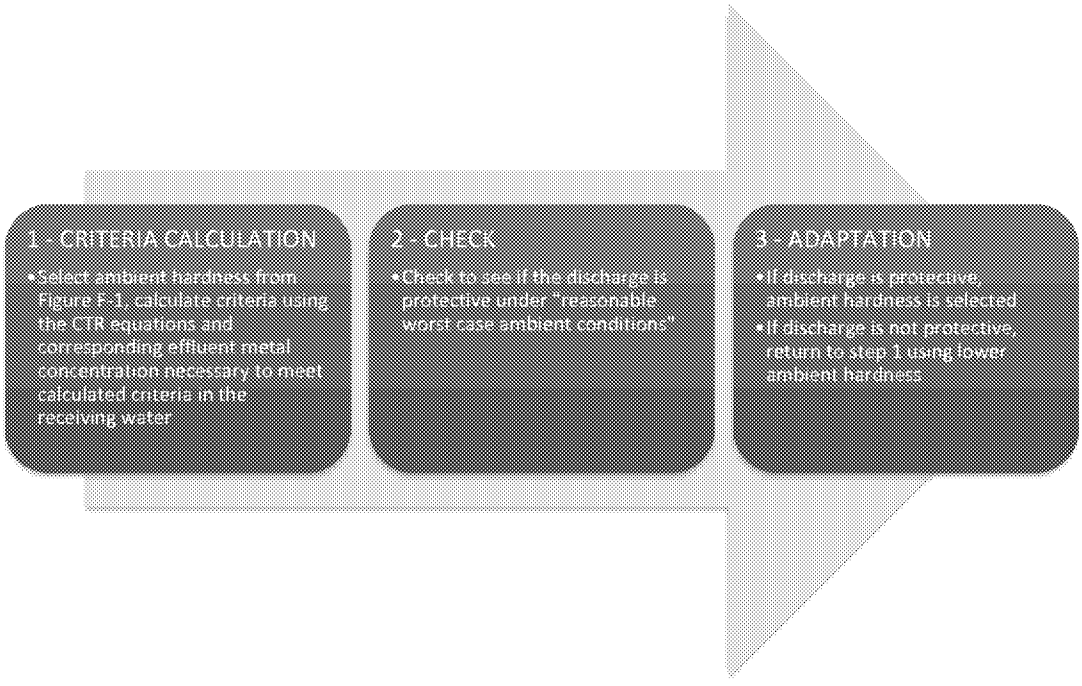
- "High receiving water flow (maximum receiving water flow)." This additional flow condition has been selected consistent with the Davis Order, which required that the hardness selected be protective of water quality criteria under all flow conditions.

- "Low receiving water hardness." The minimum receiving water hardness condition of 34 mg/L was selected to represent the reasonable worst case receiving water hardness.

- "Background ambient metal concentration at criteria." This condition assumes that the metal concentration in the background receiving water is equal to CTR criteria (upstream of the facility's discharge). Based on data in the record, this is a design condition that has not occurred in the receiving water and is used in this analysis to ensure that limits are protective of beneficial uses even in the situation where there is no assimilative capacity.

Iterative approach. An iterative analysis has been used to select the ambient hardness to calculate the criteria that will result in effluent limitations that protect beneficial uses under all flow conditions.

The iterative approach is summarized in the following algorithm and described below in more detail.



1. CRITERIA CALCULATION. CTR criteria are calculated using the CTR equations based on actual measured ambient hardness sample results, starting with the maximum observed ambient hardness of 152 mg/L. Effluent metal concentrations necessary to meet the above calculated CTR criteria in the receiving water are calculated in accordance with the SIP.[9] This should not be confused with an effluent limit. Rather, it is the Effluent Concentration Allowance (ECA), which is synonymous with the wasteload allocation defined by USEPA as "a definition of effluent water quality that is necessary to meet the water quality standards in the receiving water."[10] If effluent limits are found to be needed, the limits are calculated to enforce the ECA considering effluent variability and the probability basis of the limit.

2. CHECK. USEPA's simple mass balance equation[11] is used to evaluate if discharge at the computed ECA is protective. Resultant downstream metal concentrations are compared with downstream calculated CTR criteria under reasonable worst-case ambient conditions.

3. ADAPT. If step 2 results in:

   (A) receiving water metal concentration that complies with CTR criteria under reasonable worst-case ambient conditions, then the hardness value is selected.

   (B) receiving water metal concentration greater than CTR criteria, then return to bullet 1, selecting a lower ambient hardness value.

The CTR's hardness dependent metals criteria equations contain metal-specific constants, so the criteria vary depending on the metal. Therefore, steps 1 through 3 must be repeated separately for each metal until ambient hardness values are determined that will result in criteria and effluent limitations that comply with the CTR and protect beneficial uses for all metals.

Results of iterative analysis

The above iterative analysis for each CTR hardness-dependent metal results in the selected ambient hardness values shown in Table F-7, above. Using these hardness values to calculate criteria, which are actual sample results collected in the receiving water, will result in effluent limitations that are protective under all ambient flow conditions. Zinc and silver are used as examples below to illustrate the results of the analysis. Tables F-8 and F-9 below summarize the numeric results of the three step iterative approach for zinc and silver. As shown in the example tables, ambient hardness values of 50 mg/L (zinc and silver) are used in the CTR equations to derive criteria and effluent limitations. Then under the "check" step,

[9] [9] SIP Section 1.4.B, Step 2, provides direction for calculating the Effluent Concentration Allowance.

[10] [10] U.S. EPA Technical Support Document for Water Quality-based Toxics Control (TSD), pg. 96.

[11] [11] U.S. EPA NPDES Permit Writers' Handbook (EPA 833-K-10-001 September 2010, pg. 6-24)

worst-case ambient receiving water conditions are used to test whether discharge results in compliance with CTR criteria and protection of beneficial uses.

The results of the above analysis, summarized in the tables below, show that the ambient hardness values selected using the three-step iterative process results in protective effluent limitations that achieve CTR criteria under all flow conditions. Tables F-8 and F-9 below, summarize the critical flow conditions. However, the analysis evaluated all flow conditions to ensure compliance with the CTR criteria at all times.

Table F-8. Verification of CTR Compliance for Zinc

Receiving water hardness used to compute effluent limitations				**50 mg/L**
Effluent Concentration Allowance (ECA) for Zinc[2]				**66.6 µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Copper Concentration[1] (µg/L)**	
1Q10	48.3	64.7	63.5	**Yes**
7Q10	48.1	64.5	63.4	**Yes**
Max receiving water flow	46.1	62.2	62.1	**Yes**

1 This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

2 The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. There is no effluent limitation for zinc as it demonstrates no reasonable potential.

Table F-9. Verification of CTR Compliance for Silver

Receiving water hardness used to compute effluent limitations				**50 mg/L**
Effluent Concentration Allowance (ECA) for Silver[2]				**1.23 µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Silver Concentration[1] (µg/L)**	
1Q10	48.3	1.2	1.1	**Yes**
7Q10	48.1	1.2	1.1	**Yes**
Max receiving water flow	46.1	1.1	1.1	**Yes**

1 This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

2 The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. There is no effluent limitation for silver as it demonstrates no reasonable potential.

3. Determining the Need for WQBEL's

Federal regulations at 40 C.F.R 122.44(d)(1)(i) state, "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." The process to determine whether a WQBEL is required is referred to as a reasonable potential analysis or RPA. Central Valley Water Board staff conducted RPA's for nearly 200 constituents, including the 126 USEPA priority toxic pollutants. This section includes details of the RPA's for constituents of concern for the Facility. The entire RPA is included in the administrative record and a summary of the constituents of concern is provided in Attachment G. For priority pollutants, the SIP dictates the procedures for conducting the RPA. For non-priority pollutants the Central Valley Water Board is not restricted to one particular RPA method, therefore, the RPA's have been conducted based on EPA guidance considering multiple lines of evidence and the site-specific conditions of the discharge.

a. **Constituents with No Reasonable Potential.** Central Valley Water Board staff conducted reasonable potential analyses for nearly 200 constituents, including the 126 USEPA priority toxic pollutants. All reasonable potential analyses are included in the administrative record and a summary of the constituents of concern is provided in Attachment G. WQBEL's are not included in this Order for constituents that do not demonstrate reasonable potential to cause or contribute to an instream excursion of an applicable water quality objective; however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation.

   Most constituents with no reasonable potential are not discussed in this Order. This section only provides the rationale for the reasonable potential analyses for the following constituents of concern that were found to have no reasonable potential after assessment of the data:

   i. **Copper**

      (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for copper. These criteria for copper are presented in dissolved concentrations, as 1-hour acute criteria and 4-day chronic criteria. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. Default USEPA translators were used for the receiving water and effluent.

      (b) **RPA Results.** Section IV.C.2.e of this Fact Sheet includes procedures for conducting the RPA for hardness-dependent CTR metals, such as copper. The CTR includes hardness-dependent criteria for copper for the receiving water. The RPA was conducted using the upstream receiving water hardness to calculate the criteria for comparison to the maximum ambient background concentration, and likewise using the reasonable worst-case downstream hardness to compare the MEC. The Discharger submitted a Copper Water Effects Ratio (WER) study along with their Report of Waste Discharge (ROWD) in August 2013 that calculated a site specific

WER of 7.55 that is applicable to the effluent. The table below shows the specific total recoverable criteria used for the RPA.

Table F-10. Total Recoverable Copper RPA

	CTR Chronic Criteria[1]	CTR Acute Criteria[1]	Maximum Concentration	Reasonable Potential? (Y/N)
Effluent	40 µg/L	55 µg/L	17 µg/L	No

[4] A Water Effects Ratio of 7.55 has been applied in order to calculate the effluent copper criteria.

Based on the available data, copper in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for the protection of freshwater aquatic life and the effluent limitations for copper are not included in this Order.

ii. **Salinity**

(a) **WQO.** Chloride, electrical conductivity (EC), total dissolved solids, and sulfate are all forms of salinity. There are no water quality criteria for the protection of aquatic life for electrical conductivity, total dissolved solids, and sulfate. The USEPA NAWQC criteria for chloride are 230 mg/L as a 4-day average and 860 mg/L as a 1-hour average.

(b) **RPA Results.**

(1) **Chloride.** There was one effluent result for chloride of 37 mg/L from the Discharger's effluent characterization sampling. These levels do not exhibit reasonable potential to cause or contribute to an excursion from the USEPA NAWQC for chloride.

(2) **Electrical Conductivity.** Not applicable

(3) **Sulfate.** Not applicable.

(4) **Total Dissolved Solids.** Not applicable.

Based on the relatively low reported salinity, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion of water quality objectives for salinity. However, since the Discharger discharges to the North Fork Calaveras River, a tributary of the New Hogan Reservoir and eventually the Sacramento-San Joaquin Delta, of additional concern is the salt contribution to Delta waters. Allowing the Discharger to increase its current salt loading may be contrary to the Region-wide effort to address salinity in the Central Valley. Therefore, this Order includes a performance-based effluent limitation of 700 µmhos/cm for EC to be applied as an annual average to limit the discharge to current levels. This performance-based effluent limitation represents the maximum annual average effluent EC concentration using data from 1 December 2014 through 31 January 2018. The maximum annual average of 667 µmhos/cm occurred during 2015. Based on the sample results for the effluent, it appears the Discharger can meet these limitations.

In order to ensure that the Discharger will continue to control the discharge of salinity, this Order includes a requirement to continue to implement a

salinity evaluation and minimization plan. Also, water supply monitoring is required to evaluate the relative contribution of salinity from the source water to the effluent.

b. **Constituents with Reasonable Potential.** The Central Valley Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for ammonia, chlorine residual, cyanide, pathogens, and pH. WQBEL's for these constituents are included in this Order. A summary of the RPA is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. **Ammonia**

(a) **WQO.** The 1999 USEPA National Ambient Water Quality Criteria (NAWQC) for the protection of freshwater aquatic life for total ammonia (the "1999 Criteria"), recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC.

The USEPA recently published national recommended water quality criteria for the protection of aquatic life from the toxic effects of ammonia in freshwater (the "2013 Criteria")[12]. The 2013 Criteria is an update to USEPA's 1999 Criteria, and varies based on pH and temperature. Although the 2013 Criteria reflects the latest scientific knowledge on the toxicity of ammonia to certain freshwater aquatic life, including new toxicity data on sensitive freshwater mussels in the Family Unionidae, the species tested for development of the 2013 Criteria may not be present in some Central Valley waterways. The 2013 Criteria document therefore states that, "*unionid mussel species are not prevalent in some waters, such as the arid west …*" and provides that, "*In the case of ammonia, where a state demonstrates that mussels are not present on a site-specific basis, the recalculation procedure may be used to remove the mussel species from the national criteria dataset to better represent the species present at the site.*"

The Central Valley Water Board issued a 3 April 2014 *California Water Code Section 13267 Order for Information: 2013 Final Ammonia Criteria for Protection of Freshwater Aquatic Life* (13267 Order) requiring the Discharger to either participate in an individual or group study to determine the presence of mussels or submit a method of compliance for complying with effluent limitations calculated assuming mussels present using the 2013 Criteria. The Discharger submitted a letter to the Central Valley Water Board indicating their participation in the Central Valley Clean Water Association Freshwater Collaborative Mussel Study. Studies are currently underway to determine how the latest scientific knowledge on the toxicity of ammonia reflected in the 2013 Criteria can be implemented in the Central Valley Region as part of a Basin Planning effort to adopt nutrient and ammonia objectives. Until the Basin Planning process is completed, the Central Valley Water Board will continue to implement the 1999 Criteria to interpret the Basin Plan's narrative

[12] [12] Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater, published August 2013 [EPA 822-R-13-001]

toxicity objective. The 1999 NAWQC for the protection of freshwater aquatic life for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the North Fork Calaveras River has a beneficial use of cold freshwater habitat and the presence of salmonids and early fish life stages in the North Fork Calaveras River is well-documented, the recommended criteria for waters where salmonids and early life stages are present were used.

The maximum permitted effluent pH is 8.5, as the Basin Plan objective for pH in the receiving stream is the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L.

(b) **RPA Results.** The Facility is a POTW that treats domestic wastewater. Untreated domestic wastewater contains ammonia in concentrations that is harmful to aquatic life and exceed the Basin Plan narrative toxicity objective. Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, "*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.*" For priority pollutants, the SIP dictates the procedures for conducting the RPA. Ammonia is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA's September 2010 NPDES Permit Writer's Manual, page 6-30, states, "*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available…A permitting authority might also determine that WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent

monitoring data." With regard to POTW's, USEPA recommends that, "*POTW's should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia in concentrations that produce detrimental physiological responses to human, plant, animal, or aquatic life would violate the Basin Plan's narrative toxicity objective. Although the Discharger nitrifies the discharge, inadequate or incomplete nitrification creates the potential for ammonia to be discharged and provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC. Therefore, the Central Valley Water Board finds the discharge has reasonable potential for ammonia and WQBEL's are required.

(c) **WQBEL's.** The Central Valley Water Board calculates WQBEL's in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day CCC. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day CCC was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day CCC, and 30-day CCC is then selected for deriving the average monthly effluent limitation (AMEL) and the average weekly effluent limitation (AWEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures. The receiving water contains assimilative capacity for ammonia, therefore, as discussed further in Section IV.C.2.d of this Fact Sheet, a dilution credit of 6 was allowed in the development of the WQBEL's for ammonia. This Order contains a final AMEL and AWEL for ammonia of 5.1 mg/L and 11.0 mg/L, respectively, based on the NAWQC (chronic criterion).

(d) **Plant Performance and Attainability.** Since September 2016, the MEC for ammonia in the effluent was 3.2 mg/L out of 61 samples. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

ii. **Chlorine Residual**

(a) **WQO.** USEPA developed NAWQC for protection of freshwater aquatic life for chlorine residual. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for chlorine residual are 0.011 mg/L and 0.019 mg/L, respectively. These criteria are protective of the Basin Plan's narrative toxicity objective.

(b) **RPA Results.** The concentrations of chlorine used to disinfect wastewater are high enough to harm aquatic life and violate the Basin Plan narrative toxicity objective if discharged to the receiving water. Reasonable potential therefore does exist and effluent limits are required.

Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, "*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.*" For priority pollutants, the SIP dictates the procedures for conducting the RPA. Chlorine is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used its judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA's September 2010 NPDES Permit Writer's Manual, page 6-30, states, "*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available…A permitting authority might also determine that WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*" With regard to POTW's, USEPA recommends that, "*POTW's should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

The Discharger uses chlorine for disinfection, which is extremely toxic to aquatic organisms. Although the Discharger uses a sulfur dioxide process to dechlorinate the effluent prior to discharge to the North Fork Calaveras River the existing chlorine use and the potential for chlorine to be discharged provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC.

(c) **WQBEL's.** The USEPA *Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001] contains statistical methods for converting chronic (4-day) and acute (1-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. However, because chlorine is an acutely toxic constituent that can and will be monitored continuously, an average 1-hour limitation is considered more appropriate than an average daily limitation. This Order contains a 4-day average

effluent limitation and 1-hour average effluent limitation for chlorine residual of 0.011 mg/L and 0.019 mg/L, respectively, based on USEPA's NAWQC, which implements the Basin Plan's narrative toxicity objective for protection of aquatic life.

(d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the continued positive presence of declorination agents indicate that chlorine residual is less than the applicable WQBELs . The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

iii. **Cyanide**

(a) **WQO.** The CTR includes maximum 1-hour average and 4-day average cyanide criteria of 22 µg/L and 5.2µg/L, respectively, for the protection of freshwater aquatic life.

(b) **RPA Results.** The MEC for cyanide was 12 µg/L, based on 44 samples collected between December 2014 and January 2018. Therefore, the discharge exhibits reasonable potential to cause or contribute to an in-stream excursion from the CTR criteria for the protection of aquatic life for cyanide.

(c) **WQBEL's.** The receiving water contains assimilative capacity for cyanide, therefore, as discussed further in Section IV.C.2.d of this Fact Sheet, a dilution credit of 6 was allowed in the development of the WQBEL's for cyanide. This Order contains a final MDEL and AMEL for cyanide of 47 µg/L and 24 µg/L, respectively, based on CTR criteria for the protection of freshwater aquatic life.

(d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 12 µg/L is less than applicable WQBEL's. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

iv. **Pathogens**

(a) **WQO.** In a letter to the Central Valley Water Board dated 8 April 1999, DDW indicated it would consider wastewater discharged to water bodies with identified beneficial uses of irrigation or contact recreation and where the wastewater receives dilution of more than 20:1 to be adequately disinfected if the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median and if the effluent coliform concentration does not exceed 240 MPN/100 mL more than once in any 30 day period.

(b) **RPA Results.** Body contact water recreation is a beneficial use of the North Fork Calaveras River. Discharge Prohibition III.C, found in the Waste Discharge Requirements section of this Order, prohibit discharge form the Facility to the North Fork Calaveras River if 20:1 dilution is not achieved. Therefore, the DDW requirements are applicable to the discharge.

(c) **WQBEL's.** Pursuant to guidance from DDW, this Order includes effluent limitations for total coliform organisms of 23 MPN/100 mL as a 7-day median and 240 MPN/100 mL, not to be exceeded more than once in a 30-day period. These coliform limits are imposed to protect the beneficial uses of the receiving water, including public health through contact recreation and drinking water pathways.

(d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 79 MPN/100 mL is less than the applicable 30-day maximum but is greater than the applicable 7-day median. However, this concentration of pathogens is not typical of the discharge and only one sample was taken during the surrounding 7- day period.. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

v. **pH**

(a) **WQO.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the *"…pH shall not be depressed below 6.5 nor raised above 8.5."*

(b) **RPA Results.** Raw domestic wastewater inherently has variable pH. Additionally, some wastewater treatment processes can increase or decrease wastewater pH which if not properly controlled, would violate the Basin Plan's numeric objective for pH in the receiving water. Therefore, reasonable potential exists for pH and WQBEL's are required.

Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, "*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.*" For priority pollutants, the SIP dictates the procedures for conducting the RPA. pH is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA's September 2010 NPDES Permit Writer's Manual, page 6-30, states, "*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available…A permitting authority might also determine that WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*" (TSD, p. 50)

The Facility is a POTW that treats domestic wastewater. Although the Discharger has proper pH controls in place, the pH for the Facility's influent varies due to the nature of municipal sewage, which provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-

stream excursion above the Basin Plan's numeric objective for pH in the receiving water. Therefore, WQBEL's for pH are required in this Order.

(c) **WQBEL's.** Effluent limitations for pH of 6.5 as an instantaneous minimum and 8.5 as an instantaneous maximum are included in this Order based on protection of the Basin Plan objectives for pH.

(d) **Plant Performance and Attainability.** Based on 402 samples taken from December 2010 4 to January 2018, the maximum pH reported was 8.0 and the minimum was 6.6. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible

4. WQBEL Calculations

a. This Order includes WQBEL's for ammonia, chlorine residual, cyanide, pathogens, pH, and salinity. The general methodology for calculating WQBEL's based on the different criteria/objectives is described in subsections IV.C.5.b through e, below. See Attachment H for the WQBEL calculations.

b. **Effluent Concentration Allowance.** For each water quality criterion/objective, the ECA is calculated using the following steady-state mass balance equation from Section 1.4 of the SIP:

$$ECA = C + D(C - B) \quad \text{where } C>B, \text{ and}$$
$$ECA = C \quad \text{where } C \leq B$$

where:

ECA = effluent concentration allowance
D = dilution credit
C = the priority pollutant criterion/objective
B = the ambient background concentration.

According to the SIP, the ambient background concentration (B) in the equation above shall be the observed maximum with the exception that an ECA calculated from a priority pollutant criterion/objective that is intended to protect human health from carcinogenic effects shall use the arithmetic mean concentration of the ambient background samples.

c. **Primary and Secondary MCLs.** For non-priority pollutants with primary MCL's to protect human health (e.g., nitrate plus nitrite), the AMEL is set equal to the primary MCL and the AWEL is calculated using the AWEL/AMEL multiplier, where the AWEL multiplier is based on a 98th percentile occurrence probability and the AMEL multiplier is from Table 2 of the SIP.

For non-priority pollutants with secondary MCL's that protect public welfare (e.g., taste, odor, and staining), WQBEL's were calculated by setting the LTA equal to the secondary MCL and using the AMEL multiplier to set the AMEL. The AWEL was calculated using the MDEL/AMEL multiplier from Table 2 of the SIP.

d. **Aquatic Toxicity Criteria.** For priority pollutants with acute and chronic aquatic toxicity criteria, the WQBEL's are calculated in accordance with Section 1.4 of the SIP. The ECAs are converted to equivalent long-term averages (i.e. LTAacute and

LTAchronic) using statistical multipliers and the lowest LTA is used to calculate the AMEL and MDEL using additional statistical multipliers. For non-priority pollutants, WQBEL's are calculated using similar procedures, except that an AWEL is determined utilizing multipliers based on a 98th percentile occurrence probability.

e. **Human Health Criteria.** For priority pollutants with human health criteria, the WQBEL's are calculated in accordance with Section 1.4 of the SIP. The AMEL is set equal to the ECA and the MDEL is calculated using the MDEL/AMEL multiplier from Table 2 of the SIP. For non-priority pollutants with human health criteria, WQBEL's are calculated using similar procedures, except that an AWEL is established using the MDEL/AMEL multiplier from Table 2 of the SIP.

Summary of Water Quality-Based Effluent Limitations
Discharge Point No.001

Table F-11. Summary of Water Quality-Based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
pH	Standard units	--	--	--	6.5	8.5
Priority Pollutants						
Cyanide, Total (as CN)	µg/L	24	--	47	--	--
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N)	mg/L	5.1	11.0	--	--	--
	lbs/day[1]	64	140	--	--	--
Chlorine, Total Residual	mg/L	--	0.011[3]	0.019[4]	--	--
Electrical Conductivity @ 25°C	µmhos/cm	700[2]	--	--	--	--
Total Coliform Organisms	MPN/100 mL	--	23[5]	240[6]	--	--

1 Based upon a permitted flow of 1.5 MGD.
2 Applied as an annual average effluent limitation.
3 Applied as a 4-day average effluent limitation.
4 Applied as a 1-hour average effluent limitation.
5 Applied as a 7-day median effluent limitation.
6 Not to be exceeded more than once in any 30-day period.

TENTATIVE DRAFT

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E section V.). This Order also contains effluent limitations for acute and chronic toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) The Basin Plan also states that, *"…effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate…".*

For priority pollutants, the SIP dictates the procedures for conducting the RPA. Acute toxicity is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Acute whole effluent toxicity is not a priority pollutant. Therefore, due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA . USEPA's September 2010 NPDES Permit Writer's Manual, page 6-30, states, "*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available…A permitting authority might also determine that WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters).*" Although the discharge has been consistently in compliance with the acute effluent limitations, the Facility is a POTW that treats domestic wastewater containing ammonia and other acutely toxic pollutants. Acute toxicity effluent limits are required to ensure compliance with the Basin Plan's narrative toxicity objective.

USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc.*" Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

Acute Toxicity. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay	70%
Median for any three consecutive bioassays	90%

b. **Chronic Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) The table below is chronic WET testing performed by the Discharger from December 2014 through January 2018. This data was used to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

Table F-12. Whole Effluent Chronic Toxicity Testing Results

Date	Fathead Minnow *Pimephales promelas* Survival (TUc)	Fathead Minnow *Pimephales promelas* Growth (TUc)	Water Flea *Ceriodaphnia dubia* Survival (TUc)	Water Flea *Ceriodaphnia dubia* Reproduction (TUc)	Green Algae *Selenastrum capricornutum* Growth (TUc)
12/16/2014	--	--	≤4	≤4	--
12/30/2014	--	--	≤4	≤4	--
1/6/2015	≤4	≤4	≤4	≤4	≤4
2/8/2016	≤4	≤4	≤4	**>4**	--
3/2/2016	--	--	≤4	≤4	--
3/21/2016	--	--	≤4	≤4	--
4/18/2016	--	--	≤4	≤4	--
5/2/2016	--	--	≤4	≤4	--
2/13/2017	≤4	≤4	≤4	**>4**	≤4

i. **RPA.** A dilution ratio of 12:1 is available for chronic whole effluent toxicity. Chronic toxicity testing results exceeding 12 chronic toxicity units (TUc) (as 100/NOEC) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective. Based on chronic toxicity testing conducted between December 2014 and February 2017 the maximum chronic toxicity result was >4 TUc on 8 February 2016, therefore, the discharge does not have reasonable potential to cause or contribute to an instream exceedance of the Basin Plan's narrative toxicity objective.

D. Final Effluent Limitation Considerations

1. Mass-based Effluent Limitations

40 C.F.R section 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 C.F.R. section 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CF.R. section 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCL's) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated based upon the design flow (Average Dry Weather Flow) permitted in section IV.A.1.f of this Order.

2. Averaging Periods for Effluent Limitations

40 C.F.R. section 122.45 (d) requires average weekly and average monthly discharge limitations for POTW's unless impracticable. For cyanide, average weekly effluent limitations have been replaced with maximum daily effluent limitations in accordance with Section 1.4 of the SIP. Furthermore, for total residual chlorine and pH, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter

averaging periods for these constituents is discussed in section IV.C.3 of this Fact Sheet.

3. Satisfaction of Anti-Backsliding Requirements

The effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order, with the exception of effluent limitations for ammonia and cyanide. The effluent limitations for these pollutants are less stringent than those in Order R5-2014-0104-01. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

a. **CWA section 402(o)(1) and 303(d)(4).** CWA section 402(o)(1) prohibits the establishment of less stringent water quality-based effluent limits "*except in compliance with Section 303(d)(4).*" CWA section 303(d)(4) has two parts: paragraph (A) which applies to nonattainment waters and paragraph (B) which applies to attainment waters.

   i. For waters where standards are not attained, CWA section 304(d)(4)(A) specifies that any effluent limit based on a TMDL or other WLA may be revised only if the cumulative effect of all such revised effluent limits based on such TMDL's or WLAs will assure the attainment of such water quality standards.

   ii. For attainment waters, CWA section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy.

   The North Fork Calaveras River is considered an attainment water for ammonia and cyanide because the receiving water is not listed as impaired on the 303(d) list for this constituent.[13] As discussed in section IV.D.4, below, relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, relaxation of the effluent limitations for ammonia and cyanide from Order R5-2014-0104-01 meets the exception in CWA section 303(d)(4)(B).

b. **CWA section 402(o)(2).** CWA section 402(o)(2) provides several exceptions to the anti-backsliding regulations. CWA 402(o)(2)(B)(i) allows a renewed, reissued, or modified permit to contain a less stringent effluent limitation for a pollutant if information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.

   As described further in section IV.C.3.b of this Fact Sheet, updated information that was not available at the time Order R5-2014-0104-01 was issued indicates that that less stringent effluent limitations for ammonia satisfy requirements in CWA section 402(o)(2). Additionally, updated information that was not available at the time Order R5-2014-0104-01 was issued indicates that less stringent effluent limitations for cyanide based on available dilution credits satisfy requirements in CWA section 402(o)(2). The updated information that supports the relaxation of effluent limitations for these constituents includes the following:

[13] [13] "The exceptions in Section 303(d)(4) address both waters in attainment with water quality standards and those not in attainment, i.e. waters on the section 303(d) impaired waters list." State Water Board Order WQ 2008-0006, Berry Petroleum Company, Poso Creek/McVan Facility.

i. **Cyanide.** Based on the North Fork Calaveras River Dilution/Mixing Zone Study submitted to the Central Valley Water Board in January 2018, a mixing zone and dilution credit of 6:1 is applicable and the receiving water contains assimilative capacity for cyanide, as discussed in section IV.C.2.d of this Fact Sheet. Therefore, this Order includes less stringent effluent limitations for cyanide based on the performance of the Facility and the available dilution.

ii. **Ammonia.** Order R5-2014-0104-01 includes ammonia limits based on the 2013 NAWQC for ammonia with mussels absent. The 2013 acute criterion is based on pH and temperature. Paired effluent pH and temperature data were used for calculation of acute criterion. Current effluent limits for ammonia have been calculated 1999 NAWQC to be consistent with other facilities while the Central Valley Water Board develops a Basin Plan amendment for ammonia.. The 1999 acute criterion is only based on pH. Furthermore, based on the North Fork Calaveras River Dilution/Mixing Zone Study submitted to the Central Valley Water Board in January 2018, a mixing zone and dilution credit of 6:1 is applicable and the receiving water contains assimilative capacity for ammonia, as discussed in section IV.C.2.d of this Fact Sheet. Therefore, this Order includes less stringent effluent limitations for ammonia based on the performance of the Facility and the available dilution.

Thus, relaxation of the effluent limitations for ammonia and cyanide from Order R5-2014-0104-01 is in accordance with CWA section 402(o)(2)(B)(i), which allows for the removal of effluent limitations based on information that was not available at the time of permit issuance.

4. Antidegradation Policies

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBEL's where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and the State Anti-Degradation Policy. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

This Order relaxes the effluent limitations for ammonia and cyanide based on the allowance of mixing zones in accordance with the Basin Plan, the SIP, U.S. EPA's *Water Quality Standards Handbook, 2nd Edition* (updated July 2007), and the TSD. As discussed in section IV.C.2.d of this Fact Sheet, the mixing zones comply with all applicable requirements and will not be adverse to the purpose of the state and federal antidegradation policies. Furthermore, the allowance of mixing zones for these pollutants will result in a minor increase in the discharge, resulting in less than 10 percent of the available assimilative capacity in the receiving water. According to U.S. EPA's memorandum on Tier 2 Antidegradation Reviews and Significance Thresholds, any individual decision to lower water quality for non-bioaccumulative chemicals that is limited to 10 percent of the available assimilative capacity represents minimal risk to the receiving water and is fully consistent with the objectives and goals of the Clean Water Act. The Central Valley Water Board finds that any lowering of water quality outside the mixing zone will be de minimus. Further, any change to water quality will not unreasonably affect present and anticipated beneficial uses and will not result in water quality less than prescribed in State Water Board policies or the Basin Plan. The

measures implemented required by this Order result in the implementation of BPTC. Thus, the relaxation of the effluent limitations for cyanide and ammonia is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and the State Antidegradation Policy.

5. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based effluent limitations and WQBEL's for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD, flow, pH, and TSS. Restrictions on BOD, flow, pH, and TSS are discussed in section IV.B.2 of this Fact Sheet. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards. For pH, both technology-based effluent limitations and water quality-based effluent limitations are applicable. The more stringent of these effluent limitations are implemented by this Order. These limitations are not more stringent than required by the CWA.

Summary of Final Effluent Limitations
Discharge Point 001

Table F-13. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis[1]
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Conventional Pollutants							
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	30	45		--	--	CFR
	lbs/day[3]	375	563	751			
	% Removal	85	--	--	--	--	
pH	standard units	--	--	--	6.5	8.5	BP
Total Suspended Solids	mg/L	30	45		--	--	CFR
	lbs/day[3]	375	563	751			
	% Removal	85	--	--	--	--	
Priority Pollutants							
Cyanide, Total (as CN)	µg/L	24	--	47	--	--	CTR
Non-Conventional Pollutants							
Ammonia Nitrogen, Total (as N)	mg/L	5.1	11.0	--	--	--	NAWQC
	lbs/day[1]	64	140	--	--	--	
Chlorine, Total Residual	mg/L	--	0.0114	0.0195			NAWQC
Electrical Conductivity @ 25°C	µmhos/cm	7002	--	--	--	--	BP
Total Coliform Organisms	MPN/100mL	--	236	2407	--	--	BP